

WHAT IS CLAIMED IS:

1. A low drag fan assembly adapted to be mounted within a ducting conduit of ram air induction system of a vehicle for cooling a heat exchanger, said low drag fan assembly comprising:

a motor having an output drive;

a motor bracketing system attached to said motor for suspending said motor within the ducting conduit of the ram air induction system;

a fan hub attached to said output drive;

a plurality of foldable fan blades hingedly attached to an outer perimeter of said fan hub;

wherein when said motor is not activated, said plurality of fan blades are folded back in a non-deployed state which is in a generally longitudinally congruent orientation with respect to the ducting conduit of the ram air induction system;

wherein when said motor is activated, said plurality of fan blades extend to a deployed state in which said plurality of blades are transversely oriented and positioned normal to the air flow path direction of the ducting conduit of the ram air induction system.

2. The assembly according to Claim 1, wherein when said motor is inactive said plurality of fan blades are held in the non-deployed state by a force from a spring.

3. The assembly according to Claim 2, wherein when said motor is activated, said plurality of fan blades extend to the deployed state when a centrifugal force imparted on said plurality of fan blades by the rotation of said motor exceeds the spring force which holds said plurality of fan blades in the non-deployed state.

4. The assembly according to Claim 3, wherein when the force exerted on said plurality of fans blades by the airflow exceeds the centrifugal force imparted on said plurality of fan blades, said plurality of fan blades fold back to the non-deployed state.

5. The assembly according to Claim 1, wherein each of said plurality of fan blades is attached to said fan hub by a foldable hinge.

6. The assembly according to Claim 5, wherein said foldable hinge provides a mechanical stop which engages of portion of said fan blade when said fan blade is extended to a fully-deployed position.

7. The assembly according to Claim 6, wherein a pitch of said plurality of fan blades assists in extending said plurality of fan blades to the fully-deployed state.

8. A low drag fan assembly in combination with a ram air induction system of a vehicle for cooling a heat exchanger, comprising:

a ram air induction system having a ducting conduit with a centerline axis; and  
a low drag fan assembly comprising:

a motor having an output drive;

a motor bracketing system attached to said motor for suspending said motor within said ducting conduit about the centerline axis;

a fan hub attached to said output drive; and

a plurality of foldable fan blades hingedly attached to an outer perimeter of said fan hub;

wherein when said motor is not activated, said plurality of fan blades are folded back in a non-deployed state which is generally longitudinally congruent to the centerline axis; and

wherein when said motor is activated, said plurality of fan blades extend to a deployed state generally normal to the centerline axis.

9. The assembly in combination with said ram air induction system according to Claim 8, further comprising a heat exchanger transversely positioned within said ducting conduit beyond said low drag fan assembly.

10. The assembly in combination with said ram air induction system according to Claim 8, wherein when said motor is inactive, said plurality of fan blades are held in the non-deployed state by a spring force.

11. The assembly in combination with said ram air induction system according to Claim 10, wherein when said motor is activated, said fan hub and said plurality of fans rotate about the centerline axis.

12. The assembly in combination with said ram air induction system according to Claim 11, wherein said plurality of fan blades extend to the deployed state when a centrifugal force imparted on said plurality of fan blades exceeds the spring force which holds said plurality of fan blades in the non-deployed state.

13. The assembly in combination with said ram air induction system according to Claim 12, wherein when the force exerted on said plurality of fans blades by the airflow exceeds the centrifugal force imparted on said plurality of fan blades by the rotation of said motor, the plurality of said fan blades fold back to the non-deployed state.

14. The assembly in combination with said ram air induction system according to Claim 8, wherein each of said plurality of fan blades is attached to said fan hub by a foldable hinge.

15. The assembly in combination with said ram air induction system according to Claim 14, wherein said foldable hinge provides a mechanical stop which engages of portion of said fan blade when said fan blade is extended to a fully-deployed position.

16. The assembly in combination with said ram air induction system according to Claim 8, wherein a pitch of said plurality of fan blades assists in extending said plurality of fan blades to the fully-deployed state.

17. The assembly in combination with said ram air induction system according to Claim 8, wherein the vehicle comprises one of an aircraft, spacecraft, ocean vessel, or land conveyance vehicle.